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THE QUARTERLY BULLETIN

— OF THE —

STATE PLANT BOARD

OF MISSISSIPPI

VOL. 2 APRIL-JULY, 1922 NOS. 1-2

PUBLISHED BY
STATE PLANT BOARD OF MISSISSIPPI
A. & M. COLLEGE, MISSISSIPPI

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THE QUARTERLY BULLETIN

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STATE PLANT BOARD

OF MISSISSIPPI

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A. & M. COLLEGE, MISSISSIPPI

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Recent Developments in Relation to the Pink Bollworm Situation in the United States

By W. D. Hunter, Member Federal Horticultural Board

Read before the annual meeting of the Mississippi Cotton Seed Crushers' Association, at Gulfport, Miss., July 6-7, 1922.

The Mississippi Cotton Seed Crushers Association has shown a very commendable spirit in the work of the Federal Government and of the State of Mississippi against the pink bollworm. Representatives of the association have attended all of the principal conferences and their influence has been a very important factor in crystalizing public sentiment throughout the South and in bringing about suitable legislation in Texas and Louisiana. The at least fairly satisfactory situation about the pest is due very largely to the interest and activity of outside organizations, among the principal of which has been the Mississippi Crushers Association.

The present statement is prepared at the suggestion of Prof. R. W. Harned. It deals in a very brief way with some of the more important features of the pink bollworm situation which have developed in the last twelve months.

One of the most favorable features of the year has been the enactment of a new pink bollworm law in Texas. This was the fourth pink bollworm statute enacted in the state. The difficulties in obtaining sufficient and drastic legislation were great on account of constitutional provisions and on account of the opposition in some quarters. The present law which is much more far reaching than any of those passed previously, makes an unequivocal statement as to the policy and determination of the state in stamping out the pest and provides appropriate machinery.

Status of Old Infestations

The scouting work was continued throughout the state of Texas and especially at points where infestation had been found previously. It will be recalled that the original infestation in the state was found at Hearne The operation of a non-cotton zone for three years appears to have stamped out the pest altogether. No infestation has been found since the original cleanup work in 1917.

A remarkable decrease in the infestation was found in the Trinity Bay area comprising seven counties in the southeastern corner of the state. In 1917, several hundred fields were found infested. In 1921 a very large amount of scouting disclosed only one single specimen of the pink bollworm in all of these counties.

In the western portion of Texas, namely, in El Paso, Ward and Reeves counties and in certain counties of New Mexico, the infestation was approximately the same as during 1920.

New Infestations

During the fall of 1921 two new infestations by the pink bollworm were found in Texas, one of these was in Ellis county and the other in Grayson. In both cases the infestation originated with seed which were shipped from Carlsbad, New Mexico, prior to the finding of infestation at that place. An examination of the records showed that many lots of Carlsbad seed had been shipped to various points in Texas and to some other states, including Oklahoma and Arkansas. For several months the most intensive form of scouting was conducted at all of the points which had received Carlsbad seed. The two infestations in Ellis and Grayson counties were the only ones discovered and it is now fairly certain that no other colonies have been established through the shipment of New Mexican seed. The situation is, therefore, much more hopeful than it was at the time of the discovery of the insect in small numbers in Ellis and Grayson counties.

The new feature of the situation arising from the finding of the pink bollworm in two counties in North Texas was considered fully at a general meeting held in Dallas on December 3, 1921, which was attended by representatives of the Mississippi Crushers Association. After an extended discussion of all features of the problem, it was decided unanimously that the effort to eradicate the pink bollworm should not be abandoned. It was considered by all present that the two infestations in North Texas were exactly comparable to the one found in 1917 at Hearne which infestation has now been eradicated.

The State of Texas operating under the new law has established small non-cotton zones in North Texas at each of the points where infestation was found. These zones are surrounded by much larger zones in which the growing of cotton and the marketing and handling of the crop are carried out under supervision. There is, therefore, no danger of spread of the pest from these two centers.

Situation in Western Texas

At the present time there are about 40,000 acres of cotton in Western Texas and New Mexico in which infestation by the pink bollworm has been found. These areas are separated from the main cotton belt

by several hundred miles of arid territory. Each of the areas has been placed under regulations which include the disinfection of the seed by heating during the process of ginning. This measure, together with the isolation, greatly reduces the danger of the spread of the insect from the western areas. These areas are under general quarantine, which prohibits or restricts the movement of cotton and cotton products, as well as farm products in general, which could by any possibility carry infestation.

The only known method of stamping out the infestation in the West is to establish non-cotton zones. It has been shown that such zones can not be maintained except on the basis of compensation to the farmers for the losses incurred by reason of the prohibition against the planting of cotton. At the present time the amount of money which would be involved in compensation is so great that it is not considered by the state authorities in Texas and New Mexico to be feasible to undertake eradication. While this is unfortunate, the importance of strict regulations and quarantines is understood and the western infestations probably do not carry any greater danger to the United States than the present situation in Mexico. There are means of holding the pest in subjection in this country which do not occur in Mexico.

The subject of eradication in the western areas must be considered in connection with eradication in Mexico. This is being studied by representatives of the Department and a special representative of the Mexican government has been in Texas for some months obtaining data for use in a possible campaign of eradication in that country. In this way, plans are being made to take up simultaneously eradication in western Texas and Mexico whenever the circumstances are favorable.

Situation in Louisiana

At the time of the original discovery of infestation in southwestern Louisiana, regulated zones were established at Shreveport, Alexandria, Broussard, Gretna and Eunice, each of which points received seed from the infested territory. During the season of 1921 it was possible to release from quarantine Alexandria, Broussard, Gretna and Eunice for the reason that during two seasons of scouting no infestation was found.

In 1921 a non-cotton zone was established at Shreveport and surrounded by a large regulated zone. The work of administering these two zones was carried out satisfactorily by the State and Federal authorities and there is every indication that this will result in the eradication of the pest.

In southwestern Louisiana including Cameron, Calcasieu and Jefferson Davis parishes, non-cotton zones were maintained for two

years ending with 1921. The work was done with great thoroughness. It was decided to allow the planting of cotton in this area during 1922, thus providing an experiment to determine whether a two-year non-cotton zone will eradicate the pink bollworm. In view of the large expense incurred in maintaining non-cotton zones, the possible reduction of the period from three to two years will be a very important matter. It is understood that if infestation is found in this section in the crop of 1922 a non-cotton zone will be established again and continued for three years.

Federal Compensation Measure

As the result of a conference which was held in Washington in April, 1921, Congress granted authority to the Department of Agriculture to participate with the states in the payment of compensation allowed to farmers in non-cotton zones. The measure provides that when non-cotton zones are established and maintained to the satisfaction of the Secretary of Agriculture, the states may be reimbursed by the Federal Government for a portion of the money paid out in the form of compensation to farmers. The amount to be paid by the Federal Government is not to exceed one-third of the actual loss suffered by the farmers and in no case to exceed $5.00 per acre. Acting under this provision the Federal Government has reimbursed the state of Louisiana to the extent of about $40,000 on account of non-cotton zones maintained during 1921.

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A NEW POTATO WEEVIL IN MISSISSIPPI*

By R. W. Harned

On March 28, 1922, F. W. McHenry of McHenry, Stone county, Mississippi, mailed to E. K. Bynum, inspector for the State Plant Board, Gulfport, a number of weevils accompanied by a postal card stating that the insects had been taken from Irish potato plants and that they were destroying Irish potatoes, tomatoes and turnips. Mr. Bynum did not recognize the insects and forwarded them to the Entomology Department of the State Plant Board at A. & M. College, Mississippi. The weevils were not recognized, and on April 3, 1922, were mailed by Mr. J. M. Langston to Dr. L. O. Howard, chief of the Bureau of Entomology, Washington, D. C. At the same time the correspondent was advised to use arsenate of lead on his infested plants. On

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*No name is used in this short article regarding the weevil, previously unknown in the United States, because Dr. L. O. Howard, chief of the Bureau of Entomology, informs us that there is still some difference of opinion among coleopterists as to the exact identity of this insect. One opinion is that it is probably a South American species belonging to the genus **Listroderes** or **Listronotus**, while another is that it is the Australian species, **Desiantha nociva.**

April 7th a telegram was received from Dr. Howard stating that this weevil was, **probably**, the South American species, **Listronotus bimaculatus.**

K. L. Cockerham of the Bureau of Entomology, E. K. Bynum, Kimble Harmon and C. H. Brannon of the Mississippi Plant Board reached McHenry on April 8th, and immediately began to investigate this new weevil. Before they reached McHenry the owner of the infested garden, Mr. W. D. Ashley, had applied arsenate of lead very thoroughly to his plants as Mr. Langston had suggested. He stated that the weevils had been very numerous at the time the first specimens were collected, but that the arsenate of lead gave almost perfect control, and that the next day after it had been used, many dead weevils were found on the ground under the plants. From Mr. Ashley's description of the work of this insect, it causes very serious damage when not brought under control, but is very easily controlled by the same methods generally used against the Colorado Potato Beetles.

On April 8th no serious damage by the weevil was found. A few weevils were found hiding just below the surface of the soil in the garden, where they had been reported very numerous two weeks earlier, but which had been sprayed twice with arsenate of lead. The weevils were found under clods and grass beneath Irish potatoes and turnips. One was found under an English pea vine, but there was nothing to indicate that it had been feeding on this plant. No weevils were found in other gardens near the infested property.

With the aid of flashlights on the night of April 10th, a number of weevils were found feeding on the plants. One man found 25 weevils in half an hour on the Ashley property. They were found on the plants just after twilight and 50 weevils were collected from two rows in about one hour, where none had been found on the plants during the day.

By April 13th six properties in McHenry had been found to be infested, some of them a quarter of a mile from the original infestation on the Ashley property. No signs of injury to the host plants could be noticed on these new properties. Only one weevil was found on each of three properties—and no more could be found even at night with the aid of flashlights. On the 13th two weevils were found on Irish potatoes in the Ashley garden as late as 8:30 a. m. They appeared to be inactive at that time and there was nothing to indicate that they were feeding.

On April 18th one weevil of this species was collected on a property five miles east of McHenry by a woman who had read a newspaper article in regard to this new weevil and had then found one in her garden; but Mr. Bynum and Mr. Brannon were unable to find any of the weevils on this property in a three-hour search.

By April 22nd an infested property had been found about two miles

north of Lyman, and another about one mile south of Saucier. At each of these places three weevils were found in a few minutes, but on other properties around Lyman and Landon no weevils were found.

On May 1, Dr. L. O. Howard wrote that some of the coleopterists in Washington had decided that the new weevil might be the Australian species, **Desiantha nociva.**

HABITS. The weevils sull and drop from the plants quickly when the plants are disturbed. They crawl slowly on the ground and are rather clumsy. In jars the weevils ate from the edges of the leaves and also ate holes in the leaves. They ate leaf veins and leaf stems, severing them in places. During the night the weevils feed freely and have been observed feeding as late as 6:00 a. m. In jars they will also feed on cabbage and lettuce.

Apparently the weevils are not attracted to lights at night. So far they have not been observed to fly. Most of the observations made in regard to this weevil have been made by E. K. Bynum, assisted by C. H. Brannon and others. They have also done most of the scouting for it.

* * * * *

THE CHRYSANTHEMUM GALL MIDGE

By D. W. Grimes

Specimens of chrysanthemums severely infested with the Chrysanthemum Gall Midge, **Diarthronomyia hypogaea,** Loen, were recently received from two greenhouses in Mississippi. In both cases the plants had been purchased originally from firms in Illinois. This is the first recorded occurrence of this pest in Mississippi. A few days later five infested shipments from Pennsylvania were intercepted.

The Chrysanthemum Gall Midge is considered the most serious pest of the chrysanthemum. It is primarily a greenhouse pest, though hardy outdoor chrysanthemum plants are also attacked. This pest occurs in the larger chrysanthemum-growing regions of the United States, which includes the area surrounding the Great Lakes, the New England and Middle Atlantic States, and in Georgia, Tennessee, California and Oregon.

In the adult stage the midge is a fragile fly 1/14 of an inch long. The abdomen of the male is yellowish orange, while that of the female is reddish orange. The adult, on emerging, leaves its pupal skin protruding from the opening of the empty gall. These galls occur on the leaves, stems, or flower heads of the plant. After hatching from the orange-colored eggs deposited on the surface of the tender tips and new growth, the larvæ bore their way into the tissues, thereby giving rise to the galls. The galls are cone-shaped and about 1/12 of

an inch long. On leaves, the galls usually appear on the upper surfaces.

All chrysanthemum plants, or cuttings, exchanged between growers of chrysanthemums should be inspected carefully before being brought into commercial houses where these plants are grown. As a further precaution the chrysanthemum plants or cuttings should be dipped in, or sprayed, with a solution made as follows:

> Dissolve 1 ounce of soap in 1 gallon of water and add to this a teaspoonful of 40% nicotine sulphate (Black Leaf 40). This treatment should be applied every four or five days for about two months or until no more new galls can be found. Trimming the plants to the ground in the spring has been recommended. "Black-Leaf 40" can be obtained from druggists, or from the manufacturers, The Tobacco By-Products and Chemical Corporation, Louisville, Kentucky.

As the Gall Midge attacks outdoor chrysanthemum plants as well, all growers of chrysanthemums whether using greenhouses or not, are urged to send specimens of suspicious looking plants to the State Plant Board for determination.

* * * * *

FIRE BLIGHT OF APPLE AND PEAR

By L. E. Miles, Plant Pathologist

One of the most serious diseases of apples and pears in Mississippi is fire-blight. It is also known by other names, as pear blight, apple blight, blossom blight, twig blight, fruit blight, canker, and collar blight, according to the tree or part attacked. It often kills trees entirely or causes their vitality to be so lowered that they are years in recovering their former productivity.

The disease is caused by a bacterium which enters the host tree through the nectaries of the blossoms, or through wounds in the young twigs made by insects, or through mechanical injuries of other sorts in the body of the tree. The greater part of the injury occurs in the spring and early summer, due to the soft, succulent condition of the twigs and young wood, which allows rapid multiplication and advance of the causative organism. At this time the bacteria work rapidly down the twigs, spurs, or shoots, into the larger limbs or trunks where cankers are formed. These cankers are very important, because it is at their edges, where complete dying out of the tissue does not occur, that the organism remains alive and is able to survive the winter. In the spring when the sap begins to flow, the few which are still alive multiply rapidly, come to the surface through lenticels or cracks in the bark, and are ready to spread the infection.

The disease may be recognized by its various and striking symptoms. In the spring, brown blossoms accompanied by the withering

and blackening of the young fruit and fruit spurs may be observed. During the periods of rainy weather there is often a sweetish, sticky, milk-white or yellowish ooze coming from these freshly blighted parts, or from the cankers on the main limbs or the body of the tree. This ooze, composed of innumerable bacteria, attracts insects and is thereby instrumental in obtaining widespread and rapid distribution of the disease germs. The black or brown withered leaves which remain on the tree for some time serve to indicate the location of blighted parts.

The cankers on the larger limbs and trunks are usually slightly sunken and blackened. The bark along their edges, between the diseased and healthy wood, is often rough and cracked. Such cankers usually occur at points where the organism has traveled down a small twig, a sucker, or a fruit spur. This is the canker-blight, or as sometimes known, the "hold-over" blight.

Fire blight is one of the most difficult orchard diseases to control. Pruning, diligently and properly done, is the only direct means of dealing with it. However, if not properly followed up, a single pruning operation may do more harm than good. Sprays have no effect on the blight except as they may decrease the number of insects which aid in the distribution of the bacteria.

Control measures may be summarized as follows:

(1) Cut out thoroughly all hold-over cankers found on the limbs and bodies of the trees. This should be done during the dormant period, preferably in the fall while the leaves are still on the trees, as they aid in locating such cankers. Smaller branches should be cut out from a foot to 18 inches below the lowest sign of the disease. In larger branches or in the trunk, the diseased area may be removed by cutting out all the dead wood and bark well into the bright, clean tissue, leaving the wound smooth. Use a sharp knife and make the lower part of the cut V-shaped to allow good drainage as this facilitates healing. Make repeated inspections to see that all cankers are removed.

(2) Disinfect the wounds described above with a solution of corrosive sublimate (one ounce to eight gallons of water). Keep this solution in wooden, glass, or porcelain vessels as it reacts with metals and rapidly loses its strength when kept in metal containers. It is a deadly poison and should be kept away from animals and children. After the wounds are dry they should be painted with a good lead and oil paint.

(3) During the growing season the orchard should be inspected each week and every blighted twig, sucker, or spur pruned out, cutting at least a foot below the lowest sign of the disease. After making each cut, disinfect the pruning instrument by wiping on a clean cloth moistened with the corrosive sublimate solution described above. Burn the blighted material promptly after removal. All suckers and

water sprouts on the large limbs and trunks should be removed, since they are especially susceptible and often allow the entrance of the organism in such a manner as to form hold-over cankers.

(4) Avoid forcing sappy wood growth by too frequent cultivation or too heavy application of fertilizers. See that the trees are not too close together, as close planting retains the soil moisture, favors rapid growth, and thus is conducive to blight. It is advisable to plant the orchard to a sod and to do everything possible to promote a slow growth, as this insures a hard wood, difficult for the blight organism to penetrate.

(5) Co-operation with neighbors should be secured if possible as the disease is carried for considerable distances by insects. In addition to the apples and pears, watch the quinces, haws, wild crabs, and related plants in the vicinity, as they are susceptible and may serve as a means for holding over the disease germs.

There is considerable difference in the degree of susceptibility among different varieties. Of pears, the Sand pear is practically immune, with the Keiffer and Duchess relatively resistant, while the Bartlett, Clapp, and LeConte are usually very susceptible. Among apples, Starr, Smith, Cider, Yellow Transparent, and various crab varieties are very susceptible. The Ben Davis, Winesap, Mammoth Black Twig, and White Winter Pearmain are mentioned among the less susceptible varieties.

* * * * *

A NEW SUGAR CANE BORER

By R. W. Harned

During the last three days of May, T. E. Holloway of the United States Bureau of Entomology and E. K. Bynum of the State Plant Board were scouting in sugar cane fields in Harrison county to determine the extent of the infestation by the sugar cane moth borer, **Diatraea saccharalis crambidoides**, Grt., when they discovered the presence of what is apparently a new sugar cane moth borer. So far none of these new borers in breeding cages have reached the adult stage. This new borer has a striking pink coloration and Mr. Holloway, who has been working with sugar cane insects for many years, believes that this may be a new pest to sugar cane in this country. It has not been noticed in sugar cane fields in Louisiana. Specimens of the larvæ sent by Mr. Holloway to Washington were determined by Mr. Heinrich of the National Museum as belonging to the family **Noctuidae**. It is apparently a voracious feeder and if abundant might easily become a very serious pest. It is hoped that before the summer is over this new pest will be definitely determined.

In this number of the Quarterly Bulletin there appears for the first time a report by E. K. Bynum in regard to the inspection of sugar cane for the moth-borers. It will be noticed that so far this new or

undetermined borer has been found only on five properties in Harrison county.

The Bureau of Entomology of the United States Department of Agriculture is co-operating with the Plant Board in making a preliminary investigation of this insect. Life history studies are being made at Gulfport and scouting is being done in at least six of the southernmost counties of the state.

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ARGENTINE ANT INFESTATIONS INCREASE

By M. R. Smith

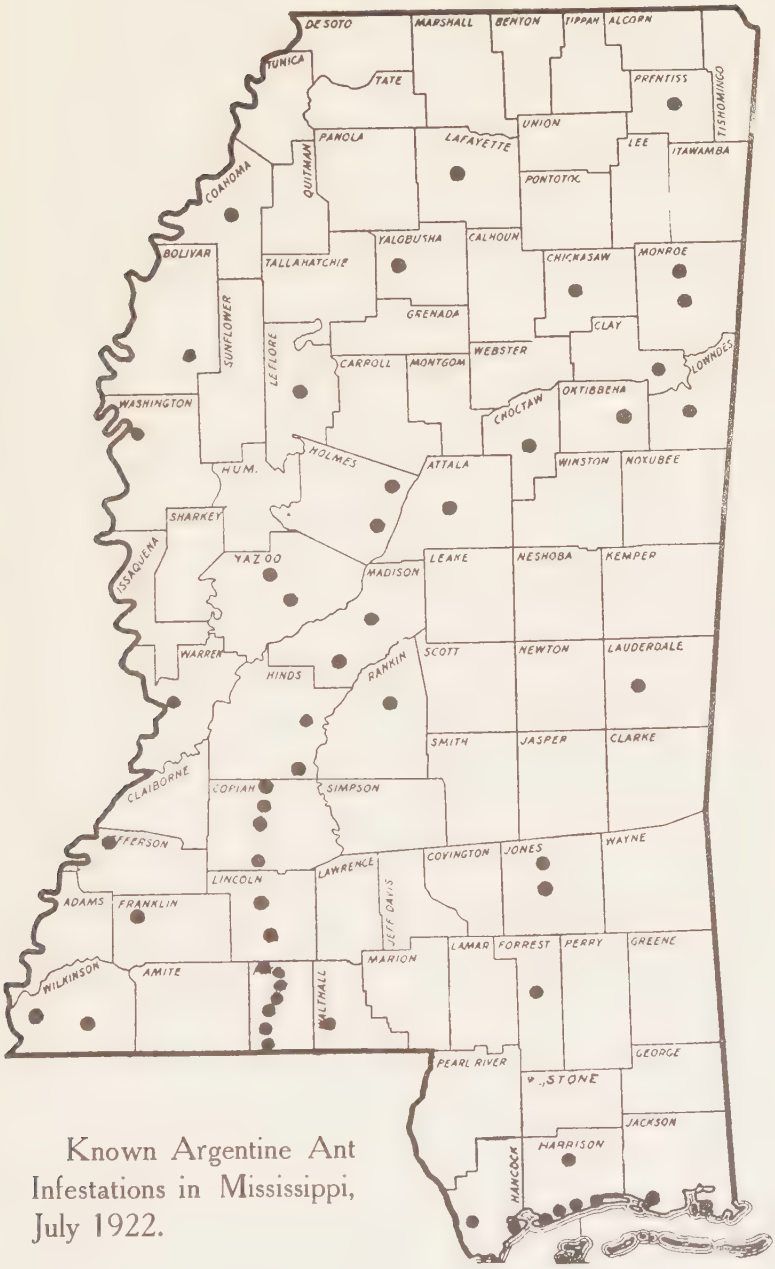
At the present time, 56 towns in Mississippi are known to be infested with Argentine ants and there are doubtless many other infestations of which the Plant Board has no record. These towns are located in 32 counties well-distributed over the state. It is interesting to note in the accompanying map how the ant infestations have followed the railroad lines, especially the main line of the Illinois Central and its branch from Durant to Aberdeen.

The infestation in some towns is very heavy, extending over the entire town and for some distance into the country In other towns only a few blocks are infested, while in still others no survey has been made and the extent of the infestation is unknown. In any case, if the ants are allowed to increase unchecked they will soon spread over a town and into the country, making it very difficult and expensive to control them. The ideal way to control them is to poison before they have covered much territory and while the expense is small.

Most people who have had any experience with the Argentine ant realize that it is one of the worst house pests known, but few are aware of the fact that the ants are a source of danger to their fruit and shade trees and ornamental plants through their habit of distributing and protecting scale insects and plant lice, pests which sap the very life of plants and destroy them if not checked.

The list of infested towns to date is given below. These towns should attempt to control the ant by poisoning campaigns. If ants are numerous and troublesome in any town not named in the following list specimens should be sent to the Plant Board for determination. The Plant Board is ready to render any possible service in putting on the control campaigns.

Infested towns are: Aberdeen, Ackerman, Amory, Benton, Biloxi, Brookhaven, Booneville, Bay St. Louis, Canton, Clarksdale, Columbus, Crystal Springs, Chatawa, Durant, Ellisville, Fort Adams, Fernwood, Gallman, Greenwood, Gulfport, Greenville, Hamburg, Hattiesburg, Houston, Norfield, Ocean Springs, Osyka, Oxford, Pascagoula, Pass Christian, Pearlington, Pelahatchie, Ridgeland, Rodney, Shaw, Starkville, Summit, Terry, Tillatoba, Tylertown, Vicksburg, West, Wesson, West Point, Woodville and Yazoo City.



Known Argentine Ant Infestations in Mississippi, July 1922.

A NEW CITRUS CANKER INFECTION

As a result of the concerted efforts of the State Plant Board and the United States Bureau of Plant Industry in a thorough citrus inspection campaign in south Mississippi, a new infection of citrus canker was discovered by Inspectors R. C. Price and W. L. Blain on June 5, in George county, on the property of J. T. Vise at Agricola, 12 miles south of Lucedale. Seven round-orange trees and three lemon trees were burned and the surrounding soil carefully disinfected.

The source of this canker remains a mystery as all the trees were seedlings and the only other citrus trees on the property were some young Satsumas which were not infected. The property is several miles distant from the nearest place canker had ever been found before. A very thorough inspection of all the properties within a radius of several miles failed to reveal any other infections.

The recent scouting and inspection campaign was the most extensive one conducted in several years. Beginning in May and extending until July 1, almost all the citrus properties in Jackson, Harrison, George, Hancock, Stone, Lamar, Forrest, Perry, Greene and Pearl River counties were inspected, not including those previously inspected by the Plant Board during the few months prior to this campaign. A total of 75,737 grove trees, 32,751 nursery trees, and 172,638 **Citrus trifoliata** trees were inspected during the period.

The success in eradicating citrus canker in Mississippi has been remarkable. Starting with 108 infected properties in 1916 it required only a short time to wipe out these spots, and until September, 1921, no new infection had been found since 1918. The discovery of this new infection in Jackson county in September, 1921, created sentiment in favor of the general scouting campaign over south Mississippi with the results just described. The finding of only one infection in a campaign so widespread and thorough, while giving ground for the belief that the state is now entirely free from canker, also emphasizes the necessity for continued scouting for this pest; for if this canker had not been found it might have become the source for the infection of a large area. The Plant Board and the Bureau of Plant Industry will continue to maintain inspectors in south Mississippi on the lookout for this dangerous pest.

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NURSERY PROSPECTS IN MISSISSIPPI

By D. W. Grimes

The people of Mississippi are annually buying from other states nearly 2,000,000 nursery plants with a conservative value of almost $500,000. It is doubtful if Mississippi nurseries are supplying more than one-third of the demand within the state at the present time.

The fact that the number of out-state nurseries shipping into Mississippi has increased more than 50% during the last two years indicates the growing demand for fruit trees on the farms of the state. This immense local demand, now largely supplied by out-state nurseries, is a challenge to the ingenuity and business ability of the Mississippi nurserymen, because Mississippi can produce high-grade nursery stock as easily and as cheaply as any other state.

To compete more successfully for this local trade, Mississippi nurserymen should study every angle of the business. More attention must be given to the demands of the trade in so far as varieties and kinds of fruits are concerned. More extensive and carefully planned advertising will be one of the best paying investments of the nurseryman, because the bulk of the trade now goes to the more extensively advertised firms. Better locations for nurseries and better cultivation to insure strong, thrifty trees must be a part of the nurseryman's program. Greater precautions against insect pests and plant diseases will also be necessary.

There are now about 130 certified nurserymen and florists in Mississippi, and the organization of an association seems very desirable from every viewpoint. With an organization, concerted plans for advertising and publicity could be carried out, a more standardized system of grading and packing would be used, and the exchange of ideas and methods at the meetings would be of great advantage to the members attending.

* * * * *

SWEET POTATO WEEVIL INVADES GEORGE COUNTY

On May 5 and 8, 1922, Inspector R. P. Colmer found sweet potato weevils on two properties in the southern part of George county. These two properties are about 1½ miles south of Basin and are within 100 yards of each other. Careful scouting on all other properties in that vicinity and especially on all properties within a mile in every direction failed to show any other infestations.

The owner of one of the infested properties thinks that the weevils were brought to his property by exchanging sacks when he took sweet potatoes to market at Moss Point and Pascagoula. This seems a very reasonable explanation and emphasizes the importance of vigilance in preventing the distribution of serious insect pests and plant diseases from one farm or from one county to another.

George county is the fifth county in Mississippi in which the sweet potato weevil has been discovered. In the other four counties, Hancock, Harrison, Jackson and Pearl River, substantial progress has been made in eradicating the weevil by the agents of the Bureau of Entomology of the United States Department of Agriculture and the

State Plant Board of Mississippi. It is of course somewhat discouraging to find that the weevil has spread into a new county. Every effort will be made to completely eradicate the weevils from this county as soon as possible. These new infestations are five miles north of Jackson county which, at the present time probably contains more properties infested by the sweet potato weevil than the other four counties combined.

* * * * *

ROSE DISEASES

By L. E. Miles

In response to many inquiries from ladies in all parts of the state in regard to rose diseases, the following information about the diseases and their control is given:

"There are two chief diseases attacking roses in this section, the so-called black spot, and powdery mildew. The first of these is widely distributed and is frequently very destructive. It consists of irregular or oval, indefinitely-bordered black spots upon the upper surface of the leaves. It occurs as a rule only upon leaves that are mature or nearly so. The larger spots are almost half an inch in diameter and coalesce so as to nearly cover whole leaflets. With age the centers turn gray and that portion of the leaf dies. At this time also, the spots become more regular in outline than during the earlier stages. Portions of the leaflets outside the diseased areas turn yellow and the affected leaflets fall off prematurely.

"The second disease, the powdery mildew, is the most widespread and destructive of all rose troubles, occurring both in the open and under glass. It is especially destructive to the Rambler varieties. In mild cases it occurs merely as flour-like, dusty, white patches on the leaves. Ordinarily it is more serious, causing the young leaves, shoots and buds to become dwarfed, curled, reddened and variously deformed. At the same time, such deformed parts are covered with a white, flour-like powder, the spores of the causative fungus, through which further dissemination occurs."

Control.—For either of these troubles Bordeaux Mixture is quite effective. It is objectionable, however, because of the unsightly residue left on the leaves. Where the mildew alone is present, a spray of potassium sulphide (liver of sulfur), 1 ounce to 2 gallons of water, is very effective. It has the added advantage of being easy to prepare and apply. It must be prepared freshly each time as it deteriorates rapidly.

"Where both diseases are present, or where black-spot alone occurs, Bordeaux Mixture may be used, or to avoid the objectionable residue on the leaves, a spray of ammoniacal copper carbonate may be prefer-

able. Ammoniacal copper carbonate should be applied once each week after the leaves are out. It is made by dissolving copper carbonate in ammonia-water in the following proportions:

Copper carbonate ----------6 ounces.
Ammonia ----------about 3 pints.
Water ----------50 gallons.

"Weigh out the proper amount of copper carbonate. Set a very small portion of this aside and dissolve the remainder in diluted ammonia, using only enough ammonia to dissolve it. Then add the portion of copper carbonate which was reserved. This will prevent an excess of ammonia which might be injurious to the tender foliage. This strong solution may be preserved indefinitely and diluted with the proper amount of water as needed.

"During the winter, the destruction of all diseased refuse beneath the bushes, such as fallen leaflets and twigs, followed by a good dormant spray, covering both the bushes and the ground beneath is of great benefit in keeping down the black-spot. This must be applied, however, while the bushes are dormant, before the new growth puts out in the spring."

* * * * *

MEALY BUGS

(**Pseudococcus** sp.)

By J. M. Langston

Mealy-bugs derive their name from the mass of mealy wax with which they cover themselves and their eggs. These are scale insects, but unlike the armoured scales, the females retain their legs and antennæ throughout life and are able to move about during most of their lives.

The most common member of this genus is the citrus mealy bug, **Pseudococcus citri.** While this insect does most of its damage to citrus fruits, it feeds on a number of different plants, including coleus, oleander, royal palm, fig, geranium, and others. The adult is about 3/16 of an inch long and half as wide with a fringe of short spines encircling the body. The brownish colored body of the insect is covered with a white waxy mass. The eggs are deposited beneath the tip of the abdomen and covered with the same waxy substance. In about two weeks the eggs hatch into young that resemble the adults except that they are smaller and at first do not have the waxy covering. Six to ten weeks are required for these to become adults.

These insects are sometimes controlled by their natural enemies, but if they are present in large numbers, spraying is the best method of reducing them. Spraying with water under considerable pressure

so as to wash the insects off the plants will sometimes control them. One pound of good laundry soap dissolved in about five gallons of water makes a good spray. Kerosene emulsion has also been recommended. To make this:

> Dissolve ⅛ pound of soap to 1¼ gallons of water, add ½ pint of kerosene, then stir vigorously until the mixture is creamy white, and apply with a spray pump, being careful that all the mealy bugs are touched with the spray. Repeat the spraying in case the insects reappear.

In case the mealy bugs are attended by the Argentine ant, it may be necessary to use measures to control the ants. When the ants are controlled, the mealy bugs will not be so troublesome, as the ants protect these insects from their natural enemies.

* * * * *

REPORT OF POTATO BEDDING AT FRUITLAND PARK, MISSISSIPPI

By W. L. Blain

The bedding of the sweet potatoes for the State Plant Board at Fruitland Park, for growing plants to supply the sweet potato weevil infested territory of the state, was begun on February 24 under the supervision of the writer. The land upon which the beds were made was new ground, having been cleared during the past year. Some of the lumber for the beds was in use last year, but had been thoroughly disinfected in order to prevent any possibility of disease getting into this year's crop from that source. In all, 51 beds were used to bed out the required number of bushels of potatoes. The field work was entirely in the hands of the Plant Board inspector and the culling of the potatoes in the storage house was under the direction of the grower.

Every possible precaution was taken to keep any infected potatoes from being bedded out and every potato showing signs of any disease whatever was thrown aside and burned. Everyone employed during the bedding process was repeatedly instructed to be on the lookout for any diseased potatoes and not let a single one pass. **Every potato put into the beds went through four cullings**; once in the house, again as they were emptied from the containers after being dipped, again by the people bedding them, and lastly, after all were placed the entire bed was inspected before being covered up.

The beds were 5x50 feet with a path four feet wide between the sides and three feet between the ends. The beds were in sections of 16, four wide and four long, and between each section was a roadway 8 feet wide to allow the hauling of fertilizer, dirt, and to facilitate removal of the plants later. In the bottom of each bed a layer of manure 1½ to 2½ inches thick was placed, and on this a layer of dirt

about 1½ to 2 inches thick was spread and then leveled off. The potatoes were then placed in the bed close together, a thin layer of pine straw was put on top of the potatoes to help hold them down while the slips were being drawn, and on top of this a coating of dirt about 2 inches thick completed the bedding process. The soil, a rather black sandy soil, is admirably suited for growing sweet potato plants. The beds run east and west and on the west end of each one is a sign designating the variety, and where there are two varieties in the same bed they are separated by a board and each section is labeled properly.

As previously mentioned, bedding began on February 24 and lasted five days. During this time the number of bushels of potatoes bedded was as follows: Porto Rico, 718 bushels; Pumpkin Yam, 22 bushels; Red Dooley, 150 bushels; White Dooley, 40 bushels; Nancy Hall, 100 bushels; Triumph, 300 bushels. Plants from these beds will be delivered free of charge to the owners of farms infested with the sweet potato weevil, such farms being found only in Harrison, Hancock, Jackson, and Pearl River counties. With intelligent co-operation this pest should be completely eradicated in a few years.

* * * * *

BEAN ANTHRACNOSE

By L. E. Miles

A great many reports have been received this year from various parts of the state regarding the anthracnose disease of beans. This trouble is world-wide in its distribution occurring in nearly every place where beans are grown. While the disease may be found on some plants year after year it is only during certain periods most favorable for its development that it becomes widespread and causes serious loss. Such periods are usually coincident with periods of rather heavy rainfall, associated with not too high a temperature. Just these conditions were experienced in Mississippi this past spring.

The losses from the disease are due to poor germination of affected seed, to destruction of affected seedlings, to low yield of affected plants, and to decreased value of the product. The principal loss in the production of green beans is due to the spotting of the pods, which renders them unsalable as snap beans and unfit for canning. Southern-grown beans, apparently healthy when shipped, frequently reach northern markets in a badly spotted condition, and if the disease is common in the field, pods kept over night after picking are likely to be badly rusted or spotted in the morning. The lesion may extend through the pod to the seed, discoloring it. The value of the dry seed is thereby lessened. A poor stand often results from the use of such seed, due to the failure of many to germinate, while still others succumb in the seedling stage. Plants which have survived an early attack may give a reduced yield, due to interrupted growth, though the pods themselves may not become spotted.

On the seed, the appearance most characteristic of anthracnose is a decided blackening of the affected parts. Usually this black spot is surrounded by a tawny or tan colored border, or the entire area may consist of the latter color. Sometimes such spots have a lighter center which may crack open, disclosing the affected cotyledon. The spots may occur on any part of the seed coat, and may appear as a small brown or black speck or involve more than half of the surface.

Seedlings from badly diseased seed show blackened cankers on the cotyledons or seed-leaves, in which, under moist conditions, small flesh-colored masses appear scattered over the surface of the lesions. The stem may become affected along its entire length, but usually only below the point of attachment of the cotyledons. The first indication of a lesion is the appearance of brown specks in the epidermis. Later there appears a browning of the tissues lengthwise of the stem and below the epidermis. Still later, small pits appear along the affected area.

The leaves not infrequently become badly affected. The lesions appear on the veins, usually on the underside of the leaf. These have practically the same appearance as those on the stems. The tissue on each side of the infected vein may wither and die. A considerable area of the leaf may become affected in this manner, giving it somewhat the appearance of blight. The petiole may become so badly affected that it cannot support the leaf blade.

It is on the pods that the disease assumes its most striking appearance. The first evidence there, is the occurence of tiny brown specks in the epidermis. These specks enlarge to spots which become black at the center, with a hazel-colored border of varying width. They may become one-half inch in diameter or even larger and may coalesce to cover the pod from end to end. A canker may extend through the pod to the seed, particularly if infection takes place early, in which case development may cease and the pod becomes shriveled and dried. The center of the spot later becomes lighter in color, and flesh-colored spore masses appear, which later dry down to gray, brown or black granulations or small pimples.

The causative fungus is **Colletotrichum lindemuthianum**, and it attacks all varieties of beans, as well as some other closely related plants. It is especially susceptible to hot, dry weather, and is almost if not entirely absent in periods so characterized. Growers in certain parts of the country, for instance Louisiana, have taken advantage of this fact, and by planting a crop about the first or middle of August, are able to obtain a crop of seed free from the trouble which may be used for planting the following spring.

As preventive measures, the best one that can be given is the use of disease-free seed. If possible they should be obtained from fields

Anthracnose on Pods of Wax and Green-Pod Beans
(From Cornell Memoir No. 42)

in the neighborhood which are known to be free of the trouble. If no such fields are available, the precaution of growing a fall crop may be taken, or hand selection may be resorted to. Only pods without spots should be chosen, if possible from disease-free plants, and after shelling, the seed should be gone over again and every one showing a blemish should be discarded. This will insure a practically disease-free stand, though it will not, of course, insure against the entrance of the disease from neighboring fields.

If the trouble is present in the field, care should be taken against spreading it while cultivating or picking. Neither should be done while the dew is on the plants, and when pods are packed for shipping, or for hauling to the canning plant, all spotted pods should be discarded; since, under such conditions, the fungus spreads rapidly.

There are certain varieties of beans which show resistance to this disease, but none of them are of the snap or stringless type. Until resistant strains of this type have been developed, precautions in the use of clean seed will have to be taken by every grower, since spraying measures have given but little satisfaction. Moreover, under our conditions on account of the intense heat and dry weather of summer and fall there is but little chance of the organism living over from one season to another on dead bean rubbish. In ordinary seasons, therefore, if proper precautions are taken to obtain clean seed, but little damage should be anticipated from this disease.

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PUBLICATIONS ISSUED BY THE STATE PLANT BOARD OF MISSISSIPPI

CIRCULAR No. 1.

Mississippi Plant Act of 1918.
Approved by the Governor, March 27, 1918.

CIRCULAR No. 2.

Rules and Regulations of the State Plant Board issued April 1, 1919. (Now obsolete. Superseded by Rules and Regulations published in Quarterly Bulletin, No. 2, Vol. 1, July 1921.)

CIRCULAR No. 3.

Rules 43, 44, and 45, issued January 16, 1920.
(Now obsolete. Rules 43 and 45 have been amended.)

CIRCULAR No. 4.

Rule 46. The Pink Bollworm Quarantine, issued March 31, 1920.
(Now obsolete. Rule amended.)

CIRCULAR No. 5.

Mississippi Plant Act of 1918 as amended 1920, approved by the Governor, April 3, 1920.

CIRCULAR No. 6.

Rule 46, The Pink Bollworm Quarantine issued September 1, 1920.
(Now obsolete. See Rule as amended April 18, 1922.)

RULES AND REGULATIONS OF THE STATE PLANT BOARD

(Reprint from Quarterly Bulletin, No. 2, Vol. 1, July 1921.)

BEE DISEASE ACT OF 1920

Approved by the Governor, April 3, 1920.

QUARANTINE CIRCULAR No. 1.

Issued April 1, 1919. Geo. F. Arnold.
(Now obsolete. Superseded by Quarantine Circular No. 2.)

QUARANTINE CIRCULAR No. 2.

Issued January 15, 1921. Geo. F. Arnold.

SUPPLEMENT A TO QUARANTINE CIRCULAR No. 2.

Issued August 1, 1921. Geo. F. Arnold.

NURSERY INSPECTION CIRCULAR No. 1.

Instructions for Mississippi nurserymen concerning Plant Board Regulations.
Issued September 10, 1918. Geo. F. Arnold.
Revised August 21, 1921, by D. W. Grimes.

NURSERY INSPECTION CIRCULAR No. 2.

Instructions to out-of-state nurserymen concerning Plant Board Regulations.
Issued September 11, 1918. Geo. F. Arnold.
(Now obsolete. Superseded by Nursery Inspection Circular No. 3.)

NURSERY INSPECTION CIRCULAR No. 3.

Instructions to out-of-state nurserymen concerning Plant Board Regulations.
Issued August 1919. Geo. F. Arnold.
Revised August 1920. D. W. Grimes.
Revised August 21, 1921. D. W. Grimes.

BIENNIAL REPORT OF THE STATE PLANT BOARD

For the years 1918-19. By R. W. Harned, Secretary.
Issued January 5, 1920.

BIENNIAL REPORT OF THE STATE PLANT BOARD

For the years 1920-21. By R. W. Harned, Secretary.
Issued January 5, 1922.

QUARTERLY BULLETIN

Published at the end of each Quarter since April 1, 1921. R. W. Harned, Editor.

Following numbers have been issued to date:

Vol. 1, No. 1, issued April 1, 1921.
Vol. 1, No. 2, issued July 1. 1921.
Vol. 1, No. 3, issued October 1, 1921.
Vol. 1, No. 4, issued January 1, 1922.

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LIST OF CERTIFIED NURSERY DEALERS IN MISSISSIPPI—SEASON 1921-1922

R. L. Brunson ---------- Laurel

B. B. Ferrell ---------- Meridian

Frank H. Harper ---------- Hattiesburg

I. Kling and Son ---------- Hattiesburg

F. T. Mullikin ---------- Kossuth

S. S. Rogers ---------- Meridian

A. P. Stuart ---------- Natchez

Vicksburg Floral Company ---------- Vicksburg

W. G. Warmood ---------- Greenwood

THE QUARTERLY BULLETIN

STATE PLANT BOARD OF MISSISSIPPI

Devoted especially to the prevention, eradication, and control of insect pests and plant diseases affecting the agricultural and horticultural interests of Mississippi.

Sent free to all citizens of Mississippi on request. Offered in exchange for publications of the Federal and foreign governments and experiment stations, entomological and mycological journals, agricultural and horticultural papers, and other publications of a similar nature.

R. W. HARNED, Entomologist----------Editor
HUNTER H. KIMBALL----------Associate Editor
CLAY LYLE----------Managing Editor

Entered as second-class matter July 9, 1921, at the post office at A. & M. College, Mississippi, under the Act of June 6, 1900.

Elsewhere in this bulletin there are short statements in regard to several insects new to Mississippi that are potential pests of great importance. The new weevil discovered in Stone and Harrison counties feeding especially on potatoes may prove to be a serious tomato weevil from Australia or a dangerous potato weevil from South America. No matter what its name may be or where it originated, it is an unwelcome guest. Equally unwelcome is the new sugar-cane borer that has so far been found on only five properties in Harrison county.

The Plant Board in co-operation with the Bureau of Entomology of the United States Department of Agriculture is investigating these new pests as thoroughly as available resources will permit. If eradication seems possible and practical, our efforts will be directed along that line. If eradication seems impractical, we hope that satisfactory control measures may soon be developed.

The early discovery of these new pests before they have had an opportunity to spread over a large area emphasizes once more the importance of having well-trained and efficient entomological inspectors constantly in the field and constantly searching for new pests. The appearance of these insects near to our Gulf ports indicates that probably the pests were brought in on vessels from foreign countries. This also emphasizes the value of our port inspection service that has been started to prevent occurrences of this kind in the future—or at least to make them much less likely to happen

We are fortunate in having in this issue a paper on the pink bollworm situation by Dr. W. D. Hunter, a member of the Federal Horticultural Board, who has been closely connected with all the investigations and efforts to eradicate this pest since its first appearance in the United States. Because of the importance of the pink bollworm to the people of Mississippi, and the fact that Dr. Hunter is doubtless more thoroughly familiar with the situation than any other person in the country, the readers of the Bulletin should not fail to give his article close attention.

* * * * *

A recent compilation of the figures taken from cotton seed permits on file in the Plant Board office indicates that the farmers of Mississippi have perhaps this spring broken all previous records in the purchase of cotton seed for planting purposes from other states. According to the permits filed for the 1922 season, 102,112 bushels of cotton seed were shipped into Mississippi for planting alone. Commenting on this, P. P. Garner, Commissioner of Agriculture and chairman of the State Plant Board, suggests that in view of the high cost of the imported seed and the great danger of bringing in the pink bollworm in seed from an undiscovered infestation in an unquarantined state, that it would be a wise plan for farmers to begin planning now to save their own planting seed for next years crop.

This is a timely suggestion. The Mississippi Experiment Station has already proven that Mississippi-grown cotton seed of any variety produces more than seed of the same variety brought from another state. Then why pay high prices and run the risk of getting the pink bollworm in seed from other states when more cotton can be made from Mississippi-grown seed? Where a farmer is not satisfied with his own seed he should make arrangements with some reliable planter or cotton breeder to supply his needs, for as Prof. Garner well says, "It is a matter of pride that Mississippi has within her borders some of the outstanding leaders in cotton breeding."

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Elsewhere in this issue is an article on the spread of the Argentine ant in Mississippi. Towns that have already had a poisoning campaign as well as those with only a small infested area cannot be too strongly urged to put out the poison this fall. Statements from many citizens in towns that poisoned the ants last fall indicate that 90% or more of the ants were killed. A news item from Hazlehurst appearing in the Brookhaven Leader of July 19, 1922, after commenting on the almost complete disappearance of the ants after the campaign, says: "The city council has spent $1,000 in conjunction with the State

Plant Board, and estimates that it has saved the townspeople at least fifty times that amount this summer." But unless this success is followed up with other campaigns it will be only a short time until the ants will be as bad as ever. Towns with small infestations should start a campaign at once while the expense will be small. Five years from now it may take $500 to check the ants where $100 would do the work this fall.

Public-spirited citizens and officials of the infested towns should begin working for poisoning campaigns at once. Mayors should request the Plant Board to survey their towns and submit estimates of the cost of campaigns. There is no charge for this. Then the town can raise the money for buying the poisoning materials and the Plant Board will furnish inspectors without charge to supervise the work as soon as the official request of the mayor is received. There should be no delay in starting as the poisoning season will soon be at hand. **Don't put it off!!**

* * * * *

LOOK FOR BEE DISEASES NOW

The progress made last summer in eradicating European and American Foulbrood from the apiaries in ten Delta counties was very gratifying as more than 6,000 colonies were examined and the diseases greatly reduced, European Foulbreed apparently decreasing 62½%, and American Foulbrood 85%. To date, American Foulbrood has been found only in Bolivar, Quitman, Sunflower and Washington counties. European Foulbrood occurs in the counties just named and also in Coahoma, Panola, Sharkey, Tallahatchie, Tunica and Yazoo counties.

However, it is possible that these diseases may occur in other parts of the state and all beekeepers should make a careful search for them at this season and at frequent intervals during the summer. Though sometimes resulting from other causes, the finding of dead larvæ (young bees) in the comb is sufficient evidence to suspect the presence of foulbrood. Samples of the comb containing the dead larvæ should be sent to the Plant Board for determination, as it is important that the Board know it if the diseases occur in other parts of the state.

For mailing, a specimen of comb 4 inches by 5 inches, or about that size, should be selected. It should contain a number of the dead larvæ and be as free from honey as possible. Wrap well in newspapers and mail in a wooden container such as a cigar box. The name and address of the sender should be plainly written on the box and a letter of explanation at the same time is advisable in order to insure a speedy reply.

ILLUSTRATED LECTURES AT SCHOOLS

To encourage boys and girls all over the state to be constantly on the watch for new pests, and to stimulate interest in the study of insect pests and plant diseases, the Plant Board has given illustrated lectures at a large number of schools over the state, showing the pink bollworm, the sweet potato weevil, the alfalfa weevil, the European corn borer, and many other pests which the Board is trying to keep out of Mississippi.

This work began in 1921 when lectures were given in more than thirty county agricultural high schools The work has been continued this year and during the past quarter lectures have been given in the agricultural high schools in the counties named below:

Alcorn	Lafayette	Tallahatchie
Amite	Leake	Tate
DeSoto	Marshall	Tunica
Greene	Montgomery	Wayne
Itawamba	Scott	Yalobusha
Jefferson	Sunflower	Yazoo

The same lectures have also been given in the following town schools and consolidated schools:

McLain (Progress Consolidated), Braxton (Piney Woods Country Life School), Clarksburg, Cleveland, McNeil, Lumberton (Hickory Grove), Baxterville, Arkabutla, Horn Lake, Ashland, Water Valley (Jefferson Davis Consolidated), Vicksburg (Culkin Academy), Bovina, Tylertown, Columbia (Mississippi Industrial and Training School), and Derby.

For the same purpose, illustrated lectures have also been shown at more than a dozen boys' club camps over the state and much interest has been manifested in many cases, not only by the boys but by their parents who were present also.

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BEE DISEASE ERADICATION REPORT

On account of heavy and frequent rains in the early spring, as well as high water in many sections of the Delta, no apiary inspection was attempted until June 1. As only a few inspectors were available for this work during June, operations were confined chiefly to the four counties named in the report below. Washington county beekeepers especially are to be congratulated on the fact that in 33 apiaries containing 1,239 colonies, the inspectors found only 11 old-fashioned box

hives. This is a record which other counties might well strive to attain.

Apiary Inspections—June 1-June 30, 1922

County—	No. of Apiaries	Box Hives	Frame Hives	Infected European Foulbrood	Infected American Foulbrood
Bolivar	11	149	580	117	15
Leflore	21	119	136	27	0
Washington	33	11	1228	111	291
Quitman	21	56	129	31	37
Total	86	335	2073	286	343

* * * * *

SUMMARY OF SCOUTING WORK DONE IN COUNTIES IN SOUTH MISSISSIPPI FOR THE SUGAR CANE BORER, DIATRAEA SACCHARALIS CRAMBIDOIDES, GRT., AND THE NEW UNDETERMINED PINK NOCTUID BORER.

By E. K. Bynum

Total number of properties inspected	60
Total number of inspections made	67
Total number of acres inspected	45
Total number of properties found infested with sugar cane borer	6
Total number of properties found infested with pink borer	5
Total number of inspections made in George county	2
Total number of inspections made in Jackson county	7
Total number of inspections made in Stone county	7
Total number of inspections made in Hancock county	7
Total number of inspections made in Harrison county	44

The pink borer has only been found in Harrison county

The sugar cane borer has been found in Harrison and Hancock counties.

QUARANTINE INSPECTION REPORT

For Period from January 1 to June 30, 1922

By Geo. F. Arnold, Quarantine Inspector

Ships and vessels inspected:

From foreign ports	40
From U. S. ports	1
Total	41

Parcels inspected:

Arriving by water—

Passed	0
Treated and passed	0
Returned to shipper	3
Destroyed	1
Total	4

Arriving by land: express, freight, wagon, etc.—

Passed	13586
Treated and passed	1
Returned to shipper	15
Contraband destroyed	57
Total	13659

Arriving by mail—

Passed	2980
Treated and passed	100
Returned to shipper	13
Contraband destroyed	63
Total	3156
Grand total of parcels inspected	16819

Number of parcels on hand June 30, 1922, pending determination as to final dispositions	33
Total parcels passed	16566
Total parcels treated and passed	101
Total parcels returned to shipper	31
Contraband destroyed	121
Grand total	16819

NURSERY INSPECTION REPORT

For Period Beginning January 1, 1922 and Ending June 30, 1922

By D. W. Grimes, Nursery Inspector

Number of nurseries inspected	122
Acreage in nurseries inspected	372½
Amount of nursery stock inspected:	
Grafted and budded pecans	279,412
Seedling pecans	147,575
Total pecans	426,987
Citrus trifoliata	97,845
Orange	28,437
Grapefruit	190
Miscellaneous citrus	40,664
Total citrus	167,136
Apples	74,550
Pears	54,032
Peach	14,325
Japanese persimmon	1,900
Grapes	13,322
Figs	14,354
Strawberry	288,989
Miscellaneous fruit	39,300
Total fruit stock (citrus excluded)	500,773
Rose	58,170
Other ornamentals	692,227
Total ornamental stock	750,397
Grand total of plants inspected during period	1,845,293

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CITRUS CANKER SCOUTING REPORT

For the Period January 1-June 30, 1922

Number of counties in the state which have at one time or another since 1916 shown canker	4
Number of counties showing canker Jan. 1-June 30	1
Number of grove trees inspected Jan. 1-June 30, 1922	75,737
Number of nursery trees inspected Jan. 1-June 30, 1922	32,751
Number of C. trifoliata inspected Jan. 1-June 30, 1922	172,638

Total number of grove trees found infected June 1, 1916 to June 30, 1922	3,097
Total number of nursery trees found infected June 1, 1916 to June 30, 1922	51,167
Number of properties infected during 1917	47
Number of properties infected during 1918	14
Number of properties infected during 1919	4
Number of properties infected during 1920	0
Number of properties infected during 1921	1
Number of properties infected during 1922	1
Number of new properties infected during 1917	12
Number of new properties infected during 1918	1
Numberof new properties infected during 1919	0
Number of new properties infected during 1920	0
Number of new properties infected during1921	1
Number of new properties infected during 1922	1
Total number of properties found infected June 1, 1916 to June 30, 1922	123
Total number of properties declared no longer danger centers	121

STAFF

(In active service, June 30, 1922)

R. W. Harned, Entomologist.
Hunter H. Kimball, Chief Inspector.
J. M. Langston, Assistant Entomologist.
D. W. Grimes, Nursery Inspector.
L. E. Miles, Plant Pathologist.
George F. Arnold, Assistant Entomologist.
J. G. Hester, Assistant Entomologist.
J. L. E. Lauderdale, Assistant Entomologist, Stoneville, Miss.
T. F. McGehee, Assistant Entomologist, Holly Springs, Miss.
M. R. Smith, Assistant Entomologist.
T. F. O'Neill, Assistant Entomologist, Raymond, Miss.
W. L. Blain, Assistant Plant Pathologist.
*R. P. Barnhart, Citrus Canker Inspector, Ocean Springs, Miss.
*E. K. Bynum, Inspector, Gulfport, Miss.
Clay Lyle, Inspector.
George E. Riley, Assistant Inspector, Vicksburg, Miss.
*R. P. Colmer, Assistant Inspector, Pascagoula, Miss.
O. M. Chance, Assistant Inspector, Jackson, Miss.
Geo. D. Dorroh, Assistant Inspector, Jackson, Miss.
J. E. Lee, Assistant Inspector, Meridian, Miss.
J. E. McEvilly, Assistant Inspector, McComb, Miss.
G. L. Lott, Assistant Inspector, Leland, Miss.
R. B. Deen, Assistant Inspector, Tupelo, Miss.
R. C. Price, Assistant Inspector.
C. G. Wallace, Assistant Inspector, Holly Springs, Miss.
M. H. Mabry, Assistant Inspector, Leland, Miss.
H. H. Carpenter, Assistant Inspector, Hattiesburg, Miss.
B. L. Collins, Assistant Inspector, Corinth, Miss.
G. W. Alexander, Assistant Inspector, Natchez, Miss.
Clyde E. Posey, Chief Clerk.
Miss Olive Moncrief, Preparator and Librarian.
Miss Nell Sulzby, Stenographer.
Miss Lydia Brooks Randle, Stenographer.
*Miss Lucille Davis, Stenographer.
Miss Lillian Mullins, Stenographer.

Note—Where no address is given above, headquarters are at A. & M. College.

Detailed by United States Department of Agriculture

K. L. Cockerham, Director Sweet Potato Weevil Eradication, Biloxi, Miss.
F. A. Wright, Field Agent, Sweet Potato Weevil Work, Bay St. Louis, Miss.
Troy Thompson, Field Agent, Sweet Potato Weevil Work, Van Cleave, Miss.
F. R. White, Field Agent, Sweet Potato Weevil Work, Lyman, Miss.
Kimble Harmon, Citrus Canker Inspector, Gulfport, Miss.
H. D. Money, Citrus Canker Inspector, Biloxi, Miss.
A. Lutken, Citrus Canker Inspector, Logtown, Miss.

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*In co-operation with the United States Department of Agriculture.